



Barnsley West, Barnsley, South Yorkshire Written Scheme of Investigation – Mitigation Strategy including Archaeological Evaluation

Client: Sterling Plc and Strata Homes

Local Planning Authority: Barnsley Borough Council
Planning Reference: TBC
NGR: SE 3162 0697

Date of Report: February 2024
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Report No.: STR01-03

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1.0 Introduction

- 1.1 Sterling Plc and Strata Homes are proposing a mixed-use development on land between the hamlets of Gawber and Higham, north of the M1 motorway, west of Barnsley, South Yorkshire (SE 3162 0697, see Figures 1-3). This document concerns land associated with two planning applications: 2021/1089 and 2021/1090 – which together form the development scheme under the generic name Barnsley West – and is to form part of the application documentation.
- 1.2 This Written Scheme of Investigation (WSI) has been prepared by Prospect Archaeology Ltd. It complies with the Chartered Institute for Archaeologists' (CIfA) *Standard for Archaeological Field Evaluation (CIfA 2023a)* and *Universal Guidance for Archaeological Field Evaluation (CIfA 2023b)*, the South Yorkshire Archaeology Service *Archaeological Field Evaluation Standards & Guidance (SYAS 2023)*.
- 1.3 The WSI lays out the proposed mitigation strategy for significant archaeology affected by the proposed development and incorporates the methodology for an initial scheme of trenching as part of a phased programme of archaeological work. The successful contractor will adhere to this scheme of works and the standards and guidance to which it refers.
- 1.4 As a default and where not covered in this WSI, excavation and recording will proceed in accordance with *SYAS Archaeological Field Evaluation Standards & Guidance*.

2.0 Site Location and Description

- 2.1 The site is approximately 117 hectares of agricultural land, between the settlements of Gawber, Pogmoor and Barnsley to the east, Barugh Green to the north, Higham to the west and the M1 motorway to the south. Hermit Lane runs northeast-southwest across the middle of the site. The land to the north is principally arable, with the farmyard of Redbrook farm on the eastern boundary. To the south of Hermit Lane the site is mostly pasture with some arable close to the M1 and to Pogmoor. Hermit House Farm lies just south of the lane in the centre of the site. Boundaries are principally post and wire or hedgerows.
- 2.2 The stream, un-named but presumably the Redbrook, flows along the eastern edge of the site, fed by a watercourses, rising within the site and converge north of Hermit's Lane.
- 2.3 To the south of Hermit's Lane the site is gently undulating, cut by watercourses/drains, though generally falling from the southeast. Adjacent to the motorway it stands at c.155m OD, falling toward the lane, at its lowest being c.105m OD.
- 2.4 North of the lane the site is relatively flat, though still falls from the southwest at c.138m OD toward the Dearne valley to the northeast, at c.83m OD.
- 2.5 The site lies on Pennine Middle Coal Measures Formation with no recorded superficial deposits (<http://mapapps.bgs.ac.uk/geologyofbritain/home.html>). Coal Authority sections show the subsoil

as yellow clay. According to the Coal Authority interactive map (<http://mapapps2.bgs.ac.uk/coalauthority/home.html>), large areas of the site have been subject to surface mining (Fig. 14). Mine entries are also recorded around Redbrook, Hermit House Farm and west of Pogmoor.

3.0 Planning Background

- 3.1 Planning applications have been submitted for two development proposals. Application 2021/1089 is a hybrid application comprising of a) Full planning permission for: earthworks to create development platforms; drainage features, including dry detention basin, embankments, bunds, location of strategic landscaping, ecological areas and access. b) Outline planning permission seeking approval for employment use development (use classes E/B2/B8) and associated servicing and infrastructure works, including car parking, vehicle, pedestrian and cycle circulations, on-plot landscaping, noise mitigation, drainage features and all associated infrastructure. (Amended Description and Amended Plans) for Land to the South East of Higham Common Road, Barnsley, outlined in blue in Figure 1.
- 3.2 Application 2021/1089 includes land granted planning permission for Highways works comprising construction of new roundabout to create a road link into MU1 Local Plan allocation site and associated alterations to existing road alignment and relocation of grade II listed milepost, granted listed building consent under planning reference 2019/1567 (Northern Roundabout, outlined in blue dash in Figure 1). Consent for this scheme (including Listed Building Consent) has already been granted subject to conditions. **For the sake of clarity, mitigation measures concerning this permission are not covered in this WSI.**
- 3.3 Application 2021/1090 is a hybrid application for residential development for 1,560 dwellings comprising: a) Full planning permission for: earthworks to create development platforms; strategic drainage ponds/dry detention basins and associated drainage infrastructure; construction of a new link road; location of strategic landscaping and ecological areas; demolition of existing buildings; works to Hermit Lane; and erection of Phase 1(a) residential development comprising 216 dwellings, b) Outline planning permission for: Residential development comprising up to 1,344 dwellings; new primary school; small shops and community facilities; and associated infrastructure works, (Amended Description and Amended Plans), for Land south of Barugh Green Road and east of Higham Common Road, Barnsley, outlined in red in Figure 1.
- 3.4 Application 2021/1090 includes land previously granted planning permission for Highways works comprising construction of new roundabout to create a road link into MU1 Local Plan allocation site and associated earthworks, alterations to existing road alignment, provision of associated footpaths, combined cycle/footpath and verges, under planning reference 2020/0028 (southern roundabout, outlined in red dash in Figure 1). **For clarity, following discussions with SYAS, no archaeological work was deemed necessary within this Site and does not form part of this WSI.**

4.0 Previous Archaeological Work

- 4.1 A desk-based Assessment was prepared by Prospect Archaeology in 2016. This identified that evidence for early prehistoric activity is restricted to a few possible early flints from the edge of the study area. The composition of the finds is not clear and there is no indication they represent a significant asset. Evidence for later prehistoric and Roman activity takes the form of cropmark/excavated enclosures. The land use of the site will not have been conducive to cropmark formation or artefact recovery that would reveal settlements, enclosures and field systems as found at Capitol Park and Low Barugh and so the potential is deemed Moderate to High for remains of the later prehistoric or Roman periods, which, based upon other local examples could be of Regional significance.
- 4.2 The site contains at least two ancient boundaries: those between Dodworth and Barnsley/Barugh and that between Barnsley and Barugh. The former would appear to survive intact in places, though with no corresponding earthwork or ditch; the latter follows the line of a natural channel draining the hillside, some of which may have been impacted by mining. These boundaries probably date back at least to the Early Medieval period and are potentially of Local significance.
- 4.3 The site avoids settlement centres of surrounding villages and, therefore, Medieval settlement cores. The phenomenon of assarting and establishment of dispersed farmsteads during this period, especially in Dodworth, means that there is the potential for Medieval settlement remains beyond village cores. The landscape around Hermit House is described in the Historic Landscape Characterisation as assarts and may have Medieval, perhaps monastic, origins and assarting is reinforced by field name evidence in the environs. The demolition and new construction over and around Hermit House will have removed most, if not all of the remains relating to this asset. Brick and concrete structures to the southwest of Hermit House farm are probably related to agricultural or mining activity of the 19th or 20th century. It is possible that remains of the neighbouring cottage remain, though this is more likely of later date. Such remains would be of Local significance. The exposed wall and stonework at the junction of footpaths west of Pogmoor could represent another isolated farmstead, medieval or post-medieval in date, although a Roman period date cannot be ruled out. On basis there is a Moderate-High potential for Medieval remains of Regional significance.
- 4.4 During the post-medieval period enclosure was completed and the area was largely agricultural, probably pasture, with a good proportion of woodland. A stone kerbed track of this period follows an ancient boundary from the western boundary of the Site and forms an access roughly east-west to the former Drury Spring.
- 4.5 Large parts of the site have been open cast mined, though the track and boundary appear to cross the area of opencast. The mining has impacted on a substantial area north of Hermit Lane, labelled opencast on the 1960s OS mapping. South of the Lane, the extent of opencast mining is not as clear. Geophysical Survey was undertaken over those areas of the Site believed not to be affected

by historic opencast mining, though the results suggest the disturbance of the Site is far more widespread than indicated by the mining data. Little of potential archaeological significance was detected on purportedly non-mined ground situated to the north of Hermit Lane, though arrays of parallel linear anomalies might signify relict ridge and furrow cultivation. Other linear responses to the north of Hermit Lane include land drains and traces of modern/recent field boundaries.

- 4.6 An extensive zone of relatively strong variation recorded on land in the western part of site, adjacent to the proposed site of the southern roundabout, probably reflects ferrous-rich spoil associated with the construction of the M1 motorway and borehole evidence suggests considerable depth of dumped overburden in this area. It is speculated that linear trends on land to the immediate south of this area might relate to vehicular traffic access from the motorway though an archaeological origin cannot be discounted.
- 4.7 The survey did register some potential for remains just south of Hermit Lane, around the location of the former Hermit Cottage as well as a few linear anomalies of possible archaeological origin. Evidence of possible cultivation patterns was also identified.
- 4.8 In general, remains are not expected to be deep or well-preserved, and even in the area of the stone footings the field has been largely denuded of vegetational cover. A date spectrum from the Late Iron Age to the modern period are all possible.

5.0 Scope of Works

- 5.1 The Mitigation Strategy has been devised in consultation with South Yorkshire Archaeology Service. It will involve a staged programme of archaeological work designed to establish the extent, character and significance of archaeological remains within the Site and to devise a suitable scheme of mitigation. The initial stage of the Strategy will be a programme of evaluation excavation consisting of the excavation of 17 trial trenches. The proposed trench locations are shown in Figures 2 and 3.

Trench Manifest

- T1-4 2m x 30m to examine the anomalies around Hermitage Cottage.
- T5-6 2m x 50m to examine potential cultivation features.
- T7-8 2m x 50m to examine geophysical anomalies of potential archaeological origin (T7) and probable modern former haul road (T8).
- T9 2m x 50m to examine the survival of former field systems and trackway
- T10-13 2m x 50m to examine geophysical anomalies of potential archaeological origin.
- T14-15 2m x 50m to examine anomalies of potential archaeological origin and the extents of former mining.
- T16-17 2m x 50m to examine a potential structure adjacent to an area of former mining.

- A contingency of 72m² (5% of sample area) of trenching has been allowed for.

5.2 The evaluation excavation will result in a report and archive. The report will be submitted to SYAS in order that a decision on the appropriate treatment (mitigation) of any archaeological remains within the site can be made. The strategy for the treatment of archaeological remains may include excavation and recording, preservation or a combination of both. Once the treatment of any remains has been agreed with SYAS, then the required standards and methodology for the archaeological mitigation (to include appropriate reporting, archiving and publication of results) will be defined in further documentation, as appropriate, to be agreed with SYAS prior to execution.

5.3 No development work will be undertaken in any area defined for mitigation until agreement has been received from SYAS.

6.0 Aims and Objectives

6.1 The purpose of the Mitigation Strategy is to establish the framework for undertaking archaeological investigation on the Barnsley West development site. It lays out the procedures and standards for undertaking the archaeological work identified in the scope of works.

6.2 The main aims of the strategy are:

1. to establish the presence/absence, nature, date, depth, quality of survival and importance of any archaeological deposits to enable an assessment of the potential and significance of the archaeological remains,
2. to allow for the determination of appropriate strategies to mitigate the effect of the proposed development upon the archaeological resource.

6.3 Specific objectives will be:

- I. To identify and appropriately manage the archaeological resource affected by the Barnsley West development;
- II. to preserve by record an appropriate sample of significant archaeological remains directly impacted by the development or, where possible within the scope of the development, to consider whether preservation in situ is desirable or achievable as the preferred option;
- III. to develop, where possible, knowledge and understanding of the historic environment and archaeological resource through recording of threatened remains; and
- IV. to engage in a programme of post-excavation assessment and analysis, archiving, synthesis and study, leading to publication and dissemination of results.

6.4 Research based objectives might include:

- How can we better understand the relationship between the historic boundaries and the development and use of the landscape?
- Is there any archaeological evidence for dispersed rural settlement outside the medieval settlement cores?

7.0 Evaluation Excavation Methodology

7.1 All groundworks will be supervised by an appropriately experienced archaeologist. When sufficient trenches are opened further staff will be brought in to complete the investigations. Contingency rates are identified to allow for further archaeological investigation if the archaeology is more extensive than anticipated. Contingency sums are in place to allow for additional post-excavation analysis if required.

7.2 The trenches will be staked out using a real-time kinematic global navigation satellite system (RTK GNSS), or other suitably accurate survey method of equivalent accuracy. Any major adjustment of targeted trenches will be agreed with SYAS in advance. The trenches will be excavated by a 360° excavator using a toothless ditching bucket under continuous archaeological supervision and in spits of no more than 0.2m. Once the trenches are stripped of topsoil all features encountered will be plotted and then excavated according to the sampling strategy.

8.0 Excavation and Recording

8.1 Following the identification of archaeological deposits, all further excavation will be by hand, by experienced/qualified archaeologists to natural undisturbed deposits. Sufficient of each feature will be excavated to determine its date and function.

8.2 Linear features will be sampled a minimum of 20% along their length (each sample section to be not less than 1m), or a minimum of a 1m sample section, if the feature is less than 5m long. Junctions of linear features with other features will also be excavated to determine stratigraphic relationships. All terminals will be excavated.

8.3 All small discrete features (postholes, stakeholes) will be fully excavated, or a sample if large numbers are encountered. Larger features will be half-sectioned.

8.4 All structures and zones of specialised activity (e.g. industrial, agricultural processing, ceremonial, funerary) will be noted and only excavated with regard to the objectives in Section 6 or where full excavation is required because the stability of the deposits has been compromised.

8.5 A metal detector will be used on Site to scan spoil heaps for ferrous and other metal objects. These will be retrieved and treated as unstratified finds.

8.6 A drawn record will be maintained, comprising a site plan showing the locations of the area excavation within the site, an overall site plan, feature plans and section drawings as appropriate.

These will be produced at appropriate scales, normally 1:100, 1:50, 1:20 and/or 1:10, as the complexity of the drawing requires. Detailed plans will be made of key features and section or elevation drawings provided of cut features and upstanding structures as appropriate. All drawings will be referenced to the overall site plan. At least one representative long section of each trench or trial pit will be drawn.

- 8.7 A photographic record of the project and of each feature will be made and photographs illustrating the relationships between groups of features and general progress will also be taken. Where film photography is used, archival record shots will be b/w film and colour digital shots will be used to supplement the record but will not form part of the formal archive. Film photography will be undertaken using panchromatic black and white film no faster than ISO400, supplemented with colour slide film. Where digital photography is used it will be undertaken in accordance with standards set by Historic England and the recipient archive.²² All digital photography will be undertaken using a high-quality camera recommended to have no less than an APS-C or DX size sensor of 10 megapixels and to be capable of generating images in TIF (v6) or unprocessed RAW format. Metric scales of appropriate size will be discreetly placed in photographs to preserve a sense scale. Where colour is an important factor, colour control patches will be used.
- 8.8 A standard single context recording system will be used to keep a documentary record of all archaeological remains that are encountered. The individual contexts will be cross-referenced as appropriate to associated features that are exposed. All context, drawing and photographic registers will be cross-referenced.
- 8.9 Finds will be bagged and labelled according to their context of origin. All finds will be treated in accordance with the recommendations contained in First Aid for Finds (Watkinson & Neale 1998, 3rd edition) and specific Historic England guidance as required. Advice will be taken on any finds requiring immediate specialist treatment.

Soil Sampling

- 8.10 Soil samples will only be taken from deposits that can be securely dated and/or placed in the Site's stratigraphic sequence. Samples will be collected in accordance with a strategy which recognises the aims and objectives of the project – see section 6 – and provision will be made for on-site advice from relevant palaeo-environmental, geo-archaeological and industrial specialists, with all recommendations being implemented, unless otherwise agreed with SYAS. Samples for environmental purposes will be taken from deposits that can be securely dated and/or placed in the site's stratigraphic sequence and in accordance with the English Heritage Environmental Archaeology (2011). Samples will be no less than 40 litres (where possible). If samples are required from discrete features that are not proposed for 100% excavation they will be taken from the unexcavated 50%. Sampling of stake-holes or small features will require the excavation of 100% of the feature.

8.11 Should waterlogged remains be encountered they will be treated in accordance with Waterlogged Wood. *Guidelines On The Recording, Sampling, Conservation And Curation Of Waterlogged Wood*, 3rd edition, (English Heritage) Historic England 2010.

8.12 Sampling will focus on deposits that have the potential to assist with the research objectives. The potential for scientific dating of industrial residues or structures will be considered as a contingency item.

Human Remains

8.13 Should human remains be encountered the consultant, curator and coroner should be informed. Removal of human remains will only take place in accordance with a Ministry of Justice licence (which may be required under the 1857 Burials Act).

Treasure

8.14 The possibility of encountering items of treasure, as defined in the Treasure Act 1996 (as supplemented by the Treasure (Designation) (Amendment) Order 2023), is noted and provision will be made for informing the necessary authorities, and providing appropriate security measures, should the need arise.

9.0 Post-excavation processing

9.1 Finds and records will be returned to the contracted unit for processing. Records will be checked and entered into a computerised database. All finds will be treated in accordance with current Historic England best practice, including 'Investigative Conservation'. Finds will be cleaned (where appropriate) and marked and boxed for transfer to the relevant specialists according to accepted principles and in line with appropriate period/ material guidelines. Environmental samples will be washed and assessed by an environmental archaeologist.

9.2 Where material suitable for scientific dating is recovered, sufficient dating will be undertaken to meet the aims of the project.

9.3 For all categories of material recovered, including finds, palaeo-environmental, industrial and other specialist samples, an assessment by an appropriately experienced specialist will be undertaken.

9.4 Environmental samples will be processed and sorted, and any artefacts recovered provided to the appropriate specialist(s) to be considered alongside the hand-recovered material. Basic stratigraphic information will be supplied to the project specialists.

9.5 Where assessment has identified the need for further analysis, this will be completed drawing upon the contingency allowed.

9.6 All ferrous objects and a selection of non-ferrous objects (including all coins), will be x-radiographed.

10.0 Reporting

10.1 A report on the evaluation excavation will be produced within 3-5 weeks of the completion of fieldwork. Digital copies of the final report will be supplied to the client for distribution to the local planning authority and the South Yorkshire Historic Environment Record. A hard copy of the report will also be supplied to SYAS on request. Additional hard copies of the report will be subject to a cover charge.

10.2 The report will contain the following sections:

- Executive Summary, brief summary of the reasons for the work, methods used and results.
- Introduction, describing the scope and circumstances of the work, archaeological background and structure of the report
- The original research aims and objectives and rationale for selected area of investigation
- Methodology
- descriptive account of the recording methods used and the results, together with an assessment of their archaeological importance, their possible relationship to relevant known features adjacent to the Development Site and estimated reliability of the results
- The results of any scientific dating
- a phased interpretation of the features
- Discussion of the results and their significance in relation to local, regional and national sites, as appropriate
- Conclusions
- specialists' reports on all categories of artefacts recovered (except modern items). Full archive lists will accompany the specialists' finds reports.
- specialists' reports on environmental samples taken (if taken)
- a complete context list with short description
- Illustrations and plates as appropriate. Illustrations to be included are: a detailed location map, a detailed site plan showing all trenches, all trench plans and sections and detailed plans and sections of features, select artefact illustrations and a selection of scanned photographs; an overall site plan showing all (phased) archaeological features will also be included.
- Archive index
- References and acknowledgements
- OASIS summary

10.3 A summary report of an appropriate length, accompanied by illustrations (at 300dpi resolution), will be prepared and submitted in digital format, for publication in the appropriate volume of Archaeology in South Yorkshire.

10.4 Provision will be made for publicising the results of the work locally, e.g. by presenting a paper at South Yorkshire Archaeology Day and talking to local societies.

10.5 Publication, in a local, regional or national journal, of the results of the investigations will be treated as a contingency.

11.0 Monitoring

- 11.1 SYAS will be given a minimum of one week's notice of the proposed start date and will be kept informed of progress throughout the field and post-excavation work. A member of Prospect Archaeology staff will monitor the excavation and post-excavation work on behalf of the client. Site monitoring visits will be co-ordinated by Prospect Archaeology.
- 11.2 Site monitoring will constitute a review point to assess the progress of the project towards addressing its aims and objectives. Recommendations for additional post-excavation analysis, further archaeological investigation, preservation and publication will be reviewed at the completion of the report.

12.0 Health and Safety

- 12.1 All site work will be carried out in accordance with the relevant current Health and Safety legislation. A copy of the Health and Safety Document is available on request and a Risk Assessment will be prepared prior to commencement of work on site.

13.0 Insurance

- 13.1 PA and its sub-contractors are fully covered by Employers and Public Liability and Professional Indemnity insurances, copies of which are available for inspection on request.

14.0 Archiving

- 14.1 The successful contractor will contact SYAS to confirm the archiving strategy through submission of a Selection Strategy and Data Management Plan. These documents will be appended to the WSI as Appendix 1 and Appendix 2 respectively. A final decision on the appropriate deposition strategy will be made once the content of the archive is known.
- 14.2 The site archive will be prepared in accordance with the UKIC's document Guidelines for the Preparation of Excavation Archives for Long Term Storage and the ClfA's *Standard and Guidance for the creation, compilation, transfer and deposition of archaeological archives 2014*.
- 14.3 Ultimately the ordered and checked archive, along with artefacts, ecofacts and relevant documents will be deposited with Experience Barnsley - Barnsley Museum and Archives Centre in accordance with the Renaissance Yorkshire 2012 "Archaeological Archive Deposition Policy for Museums in Yorkshire and the Humber". This excludes finds that are subject to the Treasure Act 1996 (and later amendments), the deposition of which will be determined separately. At the commencement of the project agreement in principle will be sought from the landowner for transfer of all material and finds to the appropriate repository; and to waive their right to compensation under the Treasure Act should such material be found. The museum will be contacted prior to the commencement of fieldwork, by submission of a completed Project Initiation Form. An accession number will be sought by the contractor at the appropriate time. Thereafter the museum will be involved in discussions with regard to selection and retention of archive

material prior to archive deposition, through completion and submission of appropriate forms. A budget to cover the museum's deposition charge has been allowed for in the project costs to the client. On completion, SYAS will be provided with a copy of the completion form, including the assigned accession number.

14.4 Born-digital data will be archived with the Archaeological Data Service in accordance with Sections 6,6-8 of SYAS 2023.

14.5 On completion of the report and archive an electronic data submission form will be completed for the Online Access to the Index of archaeological investigations (OASIS), to enable information about the site to be accessible to the wider archaeological community and the public.

14.6 The deposition of a copy of the report at the HER will be deemed to put all information in the public domain, unless a request is made for confidentiality. If material is to be held in confidence a timescale must be agreed with SYAS. In normal circumstances the agreed term does not usually exceed six months.

15.0 Public Engagement & Outreach

15.1 The location of the project on open private stock land means that there will not be a significant opportunity for public engagement or outreach during the fieldwork and it is not deemed appropriate to encourage members of the public to approach the excavations, particularly if unsupervised.

16.0 Programme & Staffing

16.1 It is not yet known when the work will be carried out. The fieldwork will be undertaken by Archaeological Services (WYAS). Fieldwork will be undertaken by a team led by a Member of the Chartered Institute for Archaeologists. CVs of staff can be provided on request. The project will be managed on behalf of the client by Prospect Archaeology Ltd.

Specialists

Prehistoric pottery specialists:	Dr C. Cumberpatch or Dr A. Tinsley
Roman pottery specialist:	Ruth Leary or Ian Rowlandson
Medieval pottery specialist:	Dr C. Cumberpatch
Flint specialist:	Dr. P. Brooks or P. Weston
Environmental specialist:	Dr D. Alldritt
Faunal analyst:	Dr J. Richardson
Human bone specialist:	M. Holst MA
Metalwork specialist:	Dr H. Cool or G. Driver
Artefact conservationist:	I. Panter

16.2 The evaluation excavation is expected to take up to 4 weeks in the field. A report will be produced in 3-5 weeks from completion on site. A suitable timetable for further elements of the project will be agreed with SYAS as appropriate.

17.0 Copyright

17.1 Notwithstanding copyright agreement between the client and the contractor, SYAS Archaeology will be granted licence to use the outputs of the work to fulfil their functions, which may include partial copying by third parties.

18.0 References

Bonnor, J, 2018 *Barnsley West, Barnsley, South Yorkshire Desk-Based Heritage Assessment*, Prospect Archaeology Ltd Report no. STR02-01

Bunn, D, 2021, *Geophysical (Gradiometer) Survey Barnsley West, Barnsley, South Yorkshire*, Pre-Construct Geophysics

CIfA 2023a *Standard for Archaeological Field Evaluation* Chartered Institute for Archaeologists, Chartered Institute for Archaeologists

CIfA 2023b *Universal Guidance for Archaeological Field Evaluation* Chartered Institute for Archaeologists

Historic England, 2011 *Environmental Archaeology: A guide to the theory and practice of methods, from sampling and recovery to post-excavation* (second edition) Centre for Archaeology Guidelines

Historic England, 2015a *Archaeometallurgy: Guidelines for Best Practice*.

Historic England 2015b *Geoarchaeology: Using Earth Sciences to Understand the Archaeological Record*.

SYAS 2023 *Archaeological Field Evaluation Standards & Guidance* South Yorkshire Archaeology Service

Watkinson, D, & Neale, V, 1998 *First Aid for Finds: Practical Guide for Archaeologists*, 3rd edition

19.0 Figures

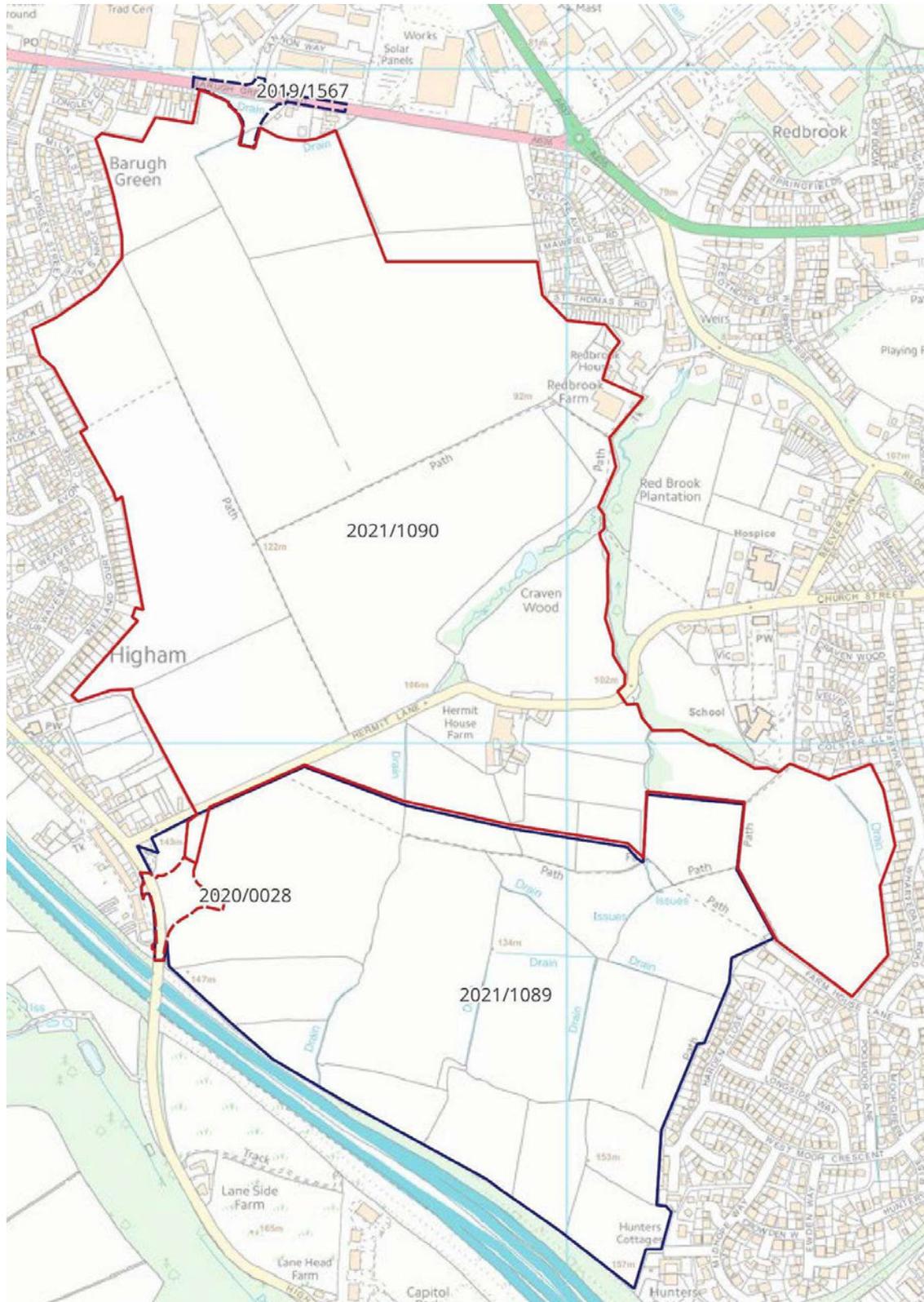


Figure 1: Site Location



Figure 3: Trench layout with geophysical survey results – east

Appendix 1 Selection Strategy

Appendix 2 Digital Management Plan

Project Details

Site Name: Barnsley West Mitigation Trenching
Client: Prospect Archaeology, Sterling Plc and Strata Homes
Project Type: Archaeological Mitigation by Trial Trenching
Location: Barnsley West, Barnsley,
County: South Yorkshire
Grid Reference: SE 3162 0697
Project Number: XN10
Site Code: BWT24
Planning Application No.: tbc
Museum Accession No.: tbc
Project Management: David Williams BA MCIfA //
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Archive officer: Zoe Horn BSc //
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20.0 Document Issue Record

Ver	Status	Author(s)	Reviewer	Approver	Date
1.0	Issue	DW	ZH	JR	04/03/2024

Data Collection

Data Standards / Methods

Standard methods of data collection will be applied throughout the project, working to best practice guidance where applicable / available. In general, data acquisition standards are defined against ADS Guides to Good Practice.

Methods of collection are specified within the Written Scheme of Investigation and will meet the requirements set out in the relevant ClfA Standards and guidance, and the ASWYAS recording manual.

Where appropriate, project contributors external to ASWYAS will be required to include data standards, collection methodology and metadata with individual reports and data.

The table below provides a summary of the data types, formats and estimated archive volume for data collected/created as part of this project. As the project progresses, more detail regarding files will be added to this DMP.

Type	Format	Estimated volume (Data Archive)
Text / documents	Word (.Docx) PDF (.pdf/a)	10 objects (size <100MB) (Written Scheme of Investigation / Digital Data Management Plan / Assessment Report / Final Report / Individual Specialist Reports x 6)
Spreadsheets	Excel (.xls)	Finds inventory x1 <1MB Environmental lab sheet x1 <1MB
Images	Lossy graphics file (.jpg) Intended deposition format - uncompressed (.tiff)	Archive shots 200 (average size 4mb) Archive shots x 200 (average size 20mb)
Graphics	AutoCAD (.dwg) Illustrator (.ai)	Site plan x2 av size <10MB Trench plans x17 av size <1MB
GIS	xml based format (jobxml; .jxl, plus associated files)	Overall .jxl file <10MB

Data storage / file naming

- The working project archive will be stored in a project specific folder or data specific folder on the Leeds City Council (LCC) server. The server is backed up daily to maintain an up-to-date security copy of all organisation-wide data.
- Project folders are named following established organisational procedures.
- Data collected will be downloaded and raw data will be stored in the appropriate folder.
- File naming conventions following established organisational procedures and include version control management.

Quality assurance

- Instruments used in the collection of data are calibrated prior to use and checked to ensure they are in full working order.
- All site records and data collected will be reviewed during project delivery to ensure data is accurate and secure.
- Data collection and management are reviewed regularly as part of the organisational Quality Policy. This includes an annual review of internal project folders to ensure our organisational data management standards are being met.

Documentation and Metadata

Data collected will include standard formats which maximise opportunities for use and reuse in the future.

Data documentation will meet the requirements of the WSI, Museum Deposition Guidelines and Digital Repository Guidelines.

A Collection Level Metadata Summary (to include project details and a summary of the data included in the archive) will be included in all standard archaeological projects and will be completed as the project is delivered. A working copy will be kept on the organisational server in the Project Folder. The Collection Level Metadata Summary brings together the overarching project details and includes a register of data types and number of objects included in the archive, along with all other archive components.

Metadata tables for each data type will be populated as the project progresses and will use the standard format for each data type as recommended by ADS, who are the intended repository for the digital data archive.

An archive catalogue documenting both physical and digital archive products will be maintained as part of the report.

Ethics and Legal Compliance

The data collected as part of this project is not expected to include the collection of any data that will require anonymisation (such as personal addresses). Any data that is collected will conform to the West Yorkshire Joint Services Data Protection Policy (version 1.1, 2019) and current GDPR legislation.

Copyright for all data collected by the project team belongs to ASWYAS and formal permission to include data from external specialists and contractors is secured on the engagement of the specialist or contractor.

Where formal permissions and/or license agreements are linked to data sharing, they will be included in the project documentation folders and will accompany the archaeological project archive.

Storage and Backup

Organisational IT is managed by Leeds City Council (LCC), who are also responsible for the management and verification of our daily back-ups and who support access to security copies as needed.

Sufficient data storage space is available via the LCC server, which includes two-factor authentication and permissions-based access. The server is accessible by staff on and offsite through a VPN and secure log-in.

Off-site access to the project files on the organisation's server is provided to support back-up of raw data while fieldwork is ongoing. Where internet access for data back-up is not possible, the raw data will be backed up to a separate media device (such as laptop and portable external hard drive).

Project files will be shared with external specialists and contractors directly via LCC's secure file sharing platforms.

Selection and Preservation

The Selection Strategy and DMP will be reviewed and updated as part of the Post-excavation Assessment and Updated Project Design, and following full analysis. Updated documentation will be included in all reporting stages.

Prior to deposition, the Selection Strategy and DMP will be updated and finalised in agreement with all project stakeholders (including the Local Planning Archaeologist, Client, Museum, ADS).

Selection will be informed by the WSI/Updated Project Design, defined against the research aims, regional and national research frameworks, specialist advice and the significance of the project results.

The project will be published as an online technical report (accessible via OASIS), with full access to research data, which raises awareness to the findings of the archaeological excavation and link to the digital archive.

The project results may provide new research data which can be included in the Historic Environment Record and will contribute to the knowledge of the archaeological remains in the area.

The data archive will be ordered, with files named and structured in a logical manner, and accompanied by relevant documentation and metadata, as outlined above.

Digital data created by ASWYAS will be deposited with the ADS which is the only repository in England with the CoreTrustSeal accreditation that will accept digital archives deriving from archaeological and historic environment fieldwork.

Data Sharing

A summary of the project will be included on the OASIS Index of Archaeological Investigation and the museum and digital archive repository, and will be updated as the project progresses.

The investigations are likely to result in a number of documents: Written Scheme of Investigation, Post-excavation Assessment, Updated Project Design and Final Report.

The final report is expected to be completed within 12 months of the completion of fieldwork.

As the project progresses reports will be attached to the project OASIS record.

A final version of the project report will be supplied to the Historic Environment Record via OASIS, and any data which they request can also be provided directly.

The location (s) of the final Archaeological Archive will be added to OASIS when appropriate.

The ADS will disseminate the digital elements of the Archaeological Archive online under a creative commons licence and the dataset will receive a unique identifier (DOI).

Data specific requirements, ethical issues or embargos which are linked to particular data formats will be documented within the relevant metadata tables accompanying the project archive.

Responsibilities and Resources

The Project Manager will be responsible for implementing the DMP, and ensuring it is reviewed and revised at each stage of the project.

Data capture, metadata production and data quality is the responsibility of the Project Team, assured by the Project Manager.

Storage and backup of data in the field is the responsibility of the Field Team.

Once data is incorporated into the organisations project server, storage and backup is managed by LCC.

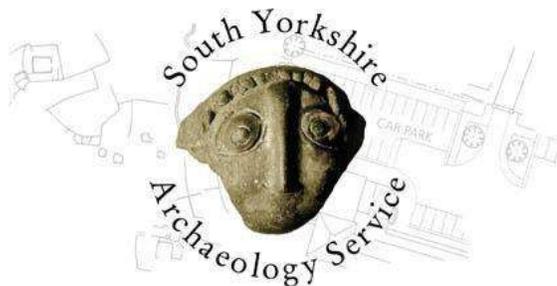
Data archiving is undertaken by the project team under the guidance of the Archives Officer, who is responsible for the transfer of the Archaeological Project Archive to the agreed repository.

Details of the core Project Team can be found in the Written Scheme of Investigation.

The project manager has overall responsibility for data capture, metadata production, data quality and correct storage and data sharing.

The security and backup of data is the responsibility of LCC.

Appendix 3 Archaeological Field Evaluation Standards & Guidance, SYAS



Archaeological Field Evaluation

Standards & Guidance

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1 Requirement for Archaeological Field Evaluation

- 1.1 An archaeological field evaluation is undertaken where there is reason to believe that archaeological remains may exist on the site, or where the significance of known remains is inadequately understood, such that the implications of a planning or other proposal cannot be adequately assessed.
- 1.2 SYAS should be consulted in advance of any field evaluation to agree a methodology.
- 1.3 Note: All references are correct at time of publication, and it is the responsibility of the undertaking body to review the guidance and ensure that they refer to the most current.

Professional Standards

- 1.4 Archaeological work should be carried out using appropriate expertise and the archaeologists undertaking the work should be adequately qualified. It is good practice to use professionally accredited experts such as a ClfA Registered Organisation¹. SYAS also maintain an open list of archaeological contractors who operate in the region.²
- 1.5 All archaeological work needs to comply with:
 - 1. the Regional Statement of Good Practice for Archaeology in the Development Process;³
 - 2. the Chartered Institute for Archaeologist's (ClfA) standards and guidance;⁴
 - 3. Historic England's guidance on managing archaeological projects (MoRPHE)⁵
 - 4. Historic England's best practice guidance relevant to the project.⁶

Written Scheme of Investigation

- 1.6 The undertaking body may be required to provide a Written Scheme of Investigation (WSI) to set out a proposed scheme of archaeological investigation in sufficient detail to demonstrate the works will be appropriate and proportionate to the known/potential remains and the anticipated level of impact.
- 1.7 The requirement and contents of a WSI on any given site should be confirmed with SYAS.
- 1.8 The WSI should be formed in reference to relevant standards, and as a minimum contain:
 - 1. Site location (including map);
 - 2. Context of the project (including planning background and consultations);
 - 3. Project timetable/ work stages;
 - 4. Strategy for seeking preservation in-situ of identified features of importance;
 - 5. Monitoring arrangements;
 - 6. Description of the site identifying its geology, topography, condition etc.;
 - 7. Brief summary of the archaeological and historical background of the site and its environs;
 - 8. Detail implications (of 6 & 7 above) for archaeological and palaeo-environmental potential (of both buried and standing remains);

¹ A register of Registered Organisations is available online: <https://www.archaeologists.net/lookingforanarchaeologist>

² Available online: <https://www.sheffield.gov.uk/home/planning-development/south-yorkshire-archaeology-service>

³ SYAS 2018

⁴ ClfA 2020a

⁵ Historic England 2015a

⁶ Available online: <https://historicengland.org.uk/advice/find/a-z-publications/>

9. Aims and objectives with reference to the South Yorkshire Historic Environment Research Framework and other period specific or thematic research frameworks/strategies, as applicable;
 10. A table listing the rationale behind the location of each trench and their dimensions (including a plan that shows their location within the site);
 11. Summary of the specific outputs of the project (e.g. report, archives etc);
 12. Methodology for site investigation, sampling, assessment, analysis and reporting;
 13. Strategy for the deposition of the project archive (including a selection strategy and data management plan produced in accordance with ClfA guidance);
 14. Strategy for publication and dissemination of the results;
 15. Details of the competent person/persons or organisation undertaking the works.
- 1.9 Appropriate specialists, including the Historic England Science Advisor, should be consulted in formulating sampling strategies and methodologies specific to the site and project objectives. This should include an outline sediment sampling strategy based on deposit modelling, suspected archaeology, and previous nearby discoveries. Provision should be allowed to revise this strategy during the fieldwork, as appropriate, to account for initial results and unexpected discoveries.
- 1.10 A template Written Scheme of Investigation covering intrusive archaeological investigations is available⁷, providing additional guidance and allowing any deviations from these standards to be identified and justified.

Selection Strategy & Data Management Plan

- 1.11 A proposed archive selection strategy must be included with the WSI, detailing the project-specific selection process, agreed by all stakeholders, for all records and materials arising from the work in creating the Archaeological Archive.
- 1.12 Where digital data is anticipated as an output of the project, the selection strategy must include a data management plan, setting out the methodology for data management from acquisition to deposition.
- 1.13 This should be produced in accordance with ClfA guidance.⁸

Monitoring

- 1.14 SYAS will be responsible for monitoring the contractor's work. The contractor must give a minimum of one week's notice of the commencement of fieldwork in order that arrangements for monitoring can be made.
- 1.15 Minor changes to an agreed WSI must be submitted to SYAS for written approval. Major changes will require the preparation of an updated WSI for submission to the approving body (SYAS or planning authority as appropriate).

⁷ See guidance for archaeological projects, available online: <https://www.sheffield.gov.uk/syas>

⁸ Available online: <https://www.archaeologists.net/selection-toolkit> & <https://www.archaeologists.net/digidigital>

2 Aims

- 2.1 The purpose of field evaluation is to gain information about the archaeological resource within a given area or site (including its presence or absence, character, extent, date, integrity, state of preservation and quality), in order to make an assessment of its merit in the appropriate context, leading to one or more of the following:
1. the formulation of a strategy to ensure the recording, preservation, or management of the resource.
 2. the formulation of a strategy to mitigate a threat to the archaeological resource.
 3. the formulation of a proposal for further archaeological investigation within a programme of research.
- 2.2 The work will be undertaken in reference to general aims and specific objectives formulated with reference to the South Yorkshire Historic Environment Research Framework⁹ and other period specific or thematic research frameworks/strategies, as applicable.
- 2.3 The level of detail included should be proportionate to the importance of any heritage assets affected, and no more than is sufficient to understand the potential impact of the proposal on archaeological significance.

⁹ Available online: <https://researchframeworks.org/syrf/>

3 Scope

- 3.1 The field evaluation should investigate the whole of the proposal area, including those areas affected by temporary works such as construction compounds.
- 3.2 The evaluation strategy chosen will represent the best means for evaluating the site, establishing the importance and significance of any remains present, and will be selected to cause the minimum impact to archaeological remains present, operating with due regard to health and safety regulations.
- 3.3 The most common forms of field evaluation employed in the region include:
 1. Geoarchaeological investigations and deposit modelling;
 2. Geophysical survey;
 3. Evaluation trenching;
 4. Shovel/test pitting.
- 3.4 Field evaluation is often an iterative process, and a combination of strategies may be required dependent on the site and project objectives. For example, after a geophysical survey, trial trenching is usually required.
- 3.5 Field evaluation should be undertaken at a stage when it can inform the design of appropriate mitigation measures, i.e., before the finalisation of any detailed designs and in advance of a planning application being made.
- 3.6 The Historic England Science Advisor can be consulted in respect to advice on appropriate approaches to fieldwork, sampling strategies and any archaeological science components.

Recommended Contingencies

- 3.7 Contingencies should be budgeted for and identified in the WSI, including, where relevant:

Geoarchaeological Investigations and Deposit Modelling

1. Further field survey, up to 10% of the total original boreholes and/or test pits;
2. Specialist analysis and scientific dating

Archaeological Geophysical Survey

1. Additional survey with a complementary technique, up to 10% of the original survey area.

Archaeological Evaluation Excavation

1. Additional trenching or trial pitting, up to 5% of the original sample area;
2. Additional specialist sampling and scientific dating;
3. Conservation of artefacts;
4. For the preparation and submission of a report including the results of post-excavation analysis, in the event that further archaeological fieldwork and follow-on reporting is not required;
5. Publication of results.

4 Geoarchaeological Investigations & Deposit Modelling

- 4.1 Geoarchaeological investigations and deposit modelling will be undertaken in accordance with standards and guidance published by Historic England.¹⁰
- 4.2 Deposit modelling is best deployed early in the planning process as it can be beneficial in identifying areas of archaeological interest/sensitivity; improving cost estimation through determining the depth and range of deposits anticipated at the site; and developing mitigation strategies.
- 4.3 Deposit models can be applied in any landscape where sediments accumulate, either through natural or anthropogenic processes, including sites of:
1. natural Quaternary (superficial) sediments;
 2. deep urban stratigraphy;
 3. other deep anthropogenic deposits, e.g. mining waste.
- 4.4 It is appropriate for the model to be constructed by a geoarchaeologist for large sites or those with complex, deep or significant deposits. On deeply stratified urban sites, they should work in partnership with an experienced urban archaeologist.
- 4.5 Deposit modelling is an iterative process and should be enhanced as additional data is collected during subsequent project stages.

Desk-Based Deposit Modelling

- 4.6 Geotechnical borehole logs for a site and its environs should be obtained from existing sources, with readily accessible information including:
1. British Geological Survey geotechnical data (via Geoindex);
 2. Previous planning applications for the site and land around it which may include geotechnical surveys (via local authority planning portals);
 3. Archaeological reports and archived data for the site and land around it held by the Historic Environment Record and the Archaeological Data Service;
 4. Quaternary Research Association's regional field guides;
 5. Relevant published literature.
- 4.7 Data should be collected beyond the site boundary to reduce discrepancies in the model and contextualise the site.
- 4.8 All data should be reviewed, cleaned, and standardised prior to creating the deposit model. The quality of the data, and its spatial distribution, should be assessed to determine whether a model can be constructed or whether additional field survey (see below) is needed before modelling can take place.
- 4.9 The South Yorkshire Historic Environment Research Framework and other relevant period-specific and thematic research frameworks and strategies should be consulted in developing research questions for the deposit model.

¹⁰ Historic England 2011, 2015e & 2020

Field Survey

- 4.10 Where gaps exist or questions remain unanswered in any desk-based model, targeted geoarchaeological boreholes and/or test pits and/or deep geophysical survey should be undertaken as an early stage of evaluation.
1. enhance coverage of existing surveys and target areas of uncertainty
 2. enable inspection by a geoarchaeologist to enhance interpretation
 3. enable recovery of finds and samples, enhancing dating
- 4.11 The method of survey will be dependent on the aims of the survey, estimated depth of the sedimentary sequence, the likely sediment characteristics, and the nature of any sampling required. In developing the survey methodology, advice should be sought from appropriate specialists such as a geoarchaeologist and the Historic England Science Advisor.
- 4.12 Borehole should be drilled to the top of the bedrock (i.e., the full Quaternary sequence). Cores can be recorded on or off site, although all samples of potential further research interest should be retained for later project stages and stored in appropriate conditions.
- 4.13 Boreholes are also required to ground truth the results of deeply penetrating geophysical surveys, and to aid in its interpretation.
- 4.14 Where geotechnical site investigations are planned ahead of development, it is encouraged that they are designed in consultation with a geoarchaeologist in order to determine whether the surveys can be integrated, and/or whether they can be monitored by a geoarchaeologist.

Data Processing

- 4.15 Depositional sequences from investigations within and around the site should be reviewed, and interpreted based on physical characteristics, and laterally equivalent deposits linked to identify stratigraphic layers across the site.
- 4.16 The surfaces of deposits derived from geophysical survey should be corroborated by ground truth boreholes.
- 4.17 The method used to prepare the deposit model will be based on the aims of the project, the desired graphical outputs, [data distribution and quality](#), and the size and complexity of the site and depositional sequence. For small or simple sites, a 2D diagram can be produced by hand or computer software. For complex sites, or where more sophisticated graphical outputs are warranted, such as 3D models, specialist software will be required. In either case, the key aim of any deposit modelling exercise is to generate outputs that are clear and informative for all end-users. Guidance from SYAS or Historic England's Science Advisor should be sought on the most appropriate outputs for any given site.

Report

- 4.18 A report will be produced, containing:
1. Non-technical summary;
 2. Site location and description of geology and topographic setting;
 3. Aims and objectives of the deposit modelling exercise;
 4. Justification and rationale for the survey methodology;
 5. Data sources, distribution, and assessment of quality;
 6. Methods used to build the model;
 7. Chronological control;

8. Statement of reliability of the model and the confidence that can be placed in it;
9. Interpretation of the site-wide deposit sequence and supporting illustrations;
10. Recommendations for how the model should be used and archived;
11. Recommendations for further archaeological work, to be determined in consultation with SYAS;
12. Relevant illustrations which should, as a basic minimum, include appropriate annotations and explanations, be clearly related to base mapping, and might include:
 - (a) site location plan;
 - (b) distribution of data points;
 - (c) location of transects (schematic cross-sections);
 - (d) one or more transects, selected, and prepared to address the model objectives
 - (e) key surface plot (eg top of bedrock or pre-Holocene surface);
 - (f) isopach maps showing extrapolated thicknesses of key units;
 - (g) zones of different archaeological potential (character maps).
13. Index to and location of digital archive
14. References
15. Acknowledgements identifying those involved in the project, including SYAS

Dissemination & Archive

- 4.19 The final report and results of the survey should be disseminated in accordance with the standards and guidelines set out in Section 7 below.
- 4.20 A project archive should be maintained and prepared in accordance with the standards and guidelines set out in Section 8 below.

5 Standards for Geophysical Survey

- 5.1 Archaeological geophysical survey will be undertaken in accordance with standards and guidance published by European Archaeological Council (EAC) and ClfA.¹¹
- 5.2 The choice of geophysical technique should be formulated in consideration of a deposit model derived from a bespoke borehole survey/ test pitting, or from the desk-based analysis of the topographic and geological context of the site, its past and present land use, and the anticipated form of archaeological remains present. The Geophysical Survey Database¹², in combination with the British Geological Survey Soil Parent Material Model¹³, should be consulted to determine effectiveness of specific techniques on local geology.
- 5.3 Where magnetometry is the chosen technique, a cart mounted system is preferred over a handheld system where terrain allows.
- 5.4 The survey area should be determined in consideration of the aims of the project, and in consultation with SYAS. Where magnetometry is the chosen technique 100% of the suitable area will be surveyed.
- 5.5 Where there is insufficient information to determine the effectiveness of a given technique (including where depth or type of sediment may prevent identification of features) then it may be necessary to trial several strategies.
- 5.6 The geophysical survey report should record the rationale for the survey area, choice of geophysical technique/s employed, and review the success of the methodology.

Survey

- 5.7 The surveyed areas will be accurately tied into the National Grid to enable the surveyed area to be independently relocated by a third party.
- 5.8 For most sites, where a phased investigation is not proposed, the survey should be of sufficient resolution to enable the delineation of individual archaeological features. An appropriate resolution for most investigations is:
 1. For magnetometry, a survey resolution of 0.5m x 0.25m;¹⁴
 2. For earth resistance, a survey resolution of 0.5m x 0.5m.¹⁵
- 5.9 Wherever possible, traverses should be oriented perpendicular to any known linear archaeological features (such as those identified from aerial photos) or else to the direction of recent ploughing.

Data Processing

- 5.10 An unaltered copy of the raw data will be retained. A minimal amount of visual processing may be applied to a copy of the data, such as destaggering, in accordance with best practice guidance.¹⁶

¹¹ EAC 2016 & ClfA 2020b

¹² Available online: https://archaeologydataservice.ac.uk/archives/view/ehgsdb_eh_2011/

¹³ Available online: <https://www.bgs.ac.uk/datasets/soil-parent-material-model/>

¹⁴ EAC 2016, 64

¹⁵ EAC 2016, 72

¹⁶ EAC 2016

Report

5.11 A report will be produced, containing:

1. Non-technical summary
2. Introductory statements
3. Aims and purpose of the evaluation
4. Methodology
5. Survey conditions
6. Results
7. Discussion of results
8. Conclusion
9. Plans/plots, including:
 - (a) a survey location plan demonstrating relationships to other mapped features and indicating the position of individual data grids (minimum scale 1:2500);
 - (b) a greyscale plot of minimally enhanced survey data (minimum scale 1:1000);
 - (c) a greyscale plot of improved survey data (minimum scale 1:1000);
 - (d) a greyscale plot of processed survey data (minimum scale 1:1000);
 - (e) a X-Y trace plot of improved magnetic data (for large sites a sample of the data might be plotted instead); and
 - (f) an interpretative plan and plans of results superimposed over first edition Ordnance Survey mapping and aerial imagery (minimum scale 1:1000).
10. Index to and location of digital archive
11. References
12. Acknowledgements identifying those involved in the project, including SYAS

Dissemination & Archive

- 5.12 The final report and results of the survey should be disseminated in accordance with the standards and guidelines set out in Section 7 below.
- 5.13 A project archive should be maintained and prepared in accordance with the standards and guidelines set out in Section 8 below.

6 Standards for Archaeological Evaluation Excavation

- 6.1 Archaeological excavation will be undertaken in accordance with ClfA standards and guidance.¹⁷
- 6.2 Detailed procedures for excavation and recording will be undertaken in accordance with professional best practice, such as that established in Historic England's *Excavation Recording Manual*.¹⁸
- 6.3 All records, finds and samples generated during the programme of works should be safely stored as part of a Working Project Archive (see Section 7).

Evaluation Strategy

- 6.4 The form of evaluation should reflect the expected nature of the archaeological evidence, and it may be necessary to deploy several strategies. For example, trial trenching for large linear features, shovel testing for flint scatters.
- 6.5 For trial trenching, the location and amount of trenching required will be dependent upon the nature of the site and the amount and quality of data from any previous investigations:
 - 1. Where non-intrusive investigations have been carried out, an appropriate level of trenching will be targeted to test anomalies, apparently blank areas, and any areas un-surveyed.
 - 2. Where no such work has been carried out, a minimum 5% sample of the site will be tested.¹⁹
- 6.6 Where there is potential for spreads of finds or deposits within the topsoil or subsoil, a programme of shovel/test pitting will be required. A suggested approach would comprise:
 - 1. Shovel pits are to be set out across a 10m survey grid;
 - 2. Pits are to measure 0.25m x 0.25m and hand excavated to a depth of 30-50cm;
 - 3. Spoil is to be sieved and finds recorded by pit.
- 6.7 The rationale for the chosen strategy will be set out in the written scheme of investigation.

Groundworks Staking Out

- 6.8 Archaeological trenches/pits will be staked out using a real-time kinematic global navigation satellite system (RTK GNSS), or other suitably accurate survey method of equivalent accuracy, in accordance with the agreed locations set out in the WSI.
- 6.9 Minor adjustments may be undertaken to avoid previously unknown obstacles such as vegetation or services, or to enable machine manoeuvring. Trenches or trial pits located to target specific features should not be moved without prior agreement of SYAS.

¹⁷ ClfA 2020c

¹⁸ Available from Historic England's website: <https://historicengland.org.uk/content/docs/research/historic-england-archaeological-recording-manual-2018/>

¹⁹ Research suggests this is the optimal minimum percentage to guarantee confidence in identifying archaeological remains across all periods (Hey & Lacy 2001, 55).

Machine Excavation

- 6.10 All machine excavation should be undertaken by adequately qualified and experienced operators, under the supervision and direction of an archaeologist, and cease at the first archaeological horizon or when the natural geology is exposed.
- 6.11 Breaking ground, whether topsoil or hardstanding, should be undertaken with care, mindful of the potential presence of archaeological deposits.
- 6.12 Machine excavation will be undertaken by backactor excavator, using a toothless bucket of appropriate width, to reduce ground levels in level spits of no more than 0.20m. Excavated areas should not be smoothed with the back of the bucket. Under no circumstances will the machine be used to cut arbitrary trenches down to natural deposits.
- 6.13 Toothed buckets are only to be used in exceptional circumstances, and where express permission has been given by the archaeologist.
- 6.14 Care should be taken when excavating onto suspected occupation sites, or entranceways, in order that subtle features or deposits are not machined off. After the depth of the archaeological horizon has been established, it may be appropriate to initially machine to just above it to enable hand excavation to establish potential before further machine stripping.

Spoil

- 6.15 Spoil should be scanned for metal artefacts using a metal detector capable of discriminating between metals, and operated by an experienced user, to enhance recovery of artefacts.

Deep Excavations

- 6.16 Where necessary to execute the objectives of the project, trenches or trial pits may need to be stepped or shored to reach their final depth. The potential for deep excavation should be identified from geotechnical data, where available, at the outset of the project and appropriate measures included in the WSI.
- 6.17 The base of the excavation will reflect the size specified for the trench/pit.

Removal of Bulk Deposits and Obstructions

- 6.18 With the prior agreement of SYAS, bulk deposits of limited archaeological interest may be machine excavated in spits (such as homogenous deposits of made ground or demolition material).
- 6.19 Large obstructions, such as boulders or engineering structures, will be left in-situ where it is safe to do so. Removal of such structures by machine will be undertaken where they are assessed to cover archaeological deposits, and only where a strategy has been agreed with SYAS on how disturbance of surrounding deposits or structures will be avoided.

Removal of Contaminated Deposits

- 6.20 The risk of contamination should be established prior to work commencing, and appropriate measures implemented to reduce or avoid risks in accordance with Historic England best practice guidance.²⁰

²⁰ Historic England 2017a

- 6.21 As soon as contaminated deposits are identified, excavation should immediately cease, and guidance be sought from the appropriate specialist/agency to establish risks and design a forward strategy for safe excavation.
- 6.22 Where hand excavation is not possible, machine excavation should be undertaken under the direction of an archaeologist. An appropriate strategy for recording will be agreed on a case-by-case basis with SYAS.

Investigation of Archaeological Features

- 6.23 Archaeological deposits will be cleaned and excavated by hand, using appropriate tools, according to accepted principles of stratigraphic excavation. The stratigraphy of the area is to be recorded, even when no archaeological deposits have been identified.
- 6.24 All features will be investigated sufficient to determine its nature, extent, and significance:
1. discrete features will be half-sectioned in the first instance;
 2. linear features will be sampled a minimum of 20% along their length (each sample section to be not less than 1 m), or a minimum of a 1 m sample section, if the feature is less than 5 m long;
 3. the deposits at junctions or interruptions in linear features will be sufficiently excavated for the relationship between components to be established. All termini will be investigated.
- 6.25 No archaeological deposit will be entirely removed unless this is necessary to meet the aims of the project.

Weathering-out, Drying and Wetting

- 6.26 Depending on the conditions of the site and geology, particularly on Sherwood/Bunter Sandstone sands and gravels, it may be necessary to allow a minimum of one week following stripping to improve visibility of archaeological deposits.
- 6.27 In dry conditions or on clayey soils it may be necessary to spray the site to show up changes in the composition of soils and identify features.
- 6.28 Waterlogged and organic-rich deposits should be kept covered and damp to reduce degradation once exposed.

Features of Unexpected Importance

- 6.29 Should features of unexpected importance or complexity be identified that would warrant special measures to record or protect them, then the supervising archaeologist should notify SYAS at the earliest opportunity to discuss an appropriate strategy for their management.

Recording

- 6.30 A standard single context recording system will be used to keep a documentary record of all archaeological remains that are encountered. The individual contexts will be cross-referenced as appropriate to associated features that are exposed.
- 6.31 Stratigraphy will be recorded in all areas of monitoring, even where no archaeological deposits have been identified, and a Harris Matrix diagram compiled.
- 6.32 All records will be checked for consistency and stratigraphic relationships.

Drawn Record

- 6.33 A range of survey methods may be applied depending on the nature of the archaeology encountered, including survey by hand, by total station, real-time kinematic global navigation satellite system (RTK GNSS), or photogrammetry. All measured survey will be undertaken in accordance with relevant guidelines.²¹
- 6.34 Hand-drawn and digital surveys will be annotated in the field to produce interpretative drawings with relevant context numbers and boundaries between features.
- 6.35 A drawing register will be maintained, recording the scale, location, date, subject, levels, and surveyor.
- 6.36 The extent of the excavated areas and archaeological features will be recorded in plan at an appropriate scale (1:500, 1:1250 or at most 1:2500), including the position of section lines, and tied into the National Grid.
- 6.37 All archaeological features will be drawn in plan and section at an appropriate scale (no less detailed than 1:50 for plans and 1:20 for sections) with Ordnance Datum heights on each drawing. At least one representative long section of each trench or trial pit will be drawn. Detailed plans will be made of key features and section, or elevation drawings provided of cut features and upstanding structures as appropriate.

Photography

- 6.38 Photographic recording (film or digital) will be required showing the site in context, all excavated trenches and individual archaeological features, and including shots of work in progress.
- 6.39 Film photography will be undertaken using panchromatic black and white film no faster than ISO400, supplemented with colour slide film.
- 6.40 Digital photography will be undertaken in accordance with standards set by Historic England and the recipient archive.²² All digital photography will be undertaken using a high-quality camera recommended to have no less than an APS-C or DX size sensor of 10 megapixels and to be capable of generating images in TIF (v6) or unprocessed RAW format.
- 6.41 A tripod will be used to allow stable longer exposures in low light conditions.
- 6.42 Metric scales of appropriate size will be discreetly placed in photographs to preserve a sense scale. Where colour is an important factor, colour control patches will be used.
- 6.43 A register recording the details of each image will be maintained, including subject, location, date, and photographer.

Finds and Samples

- 6.44 Provisions should be made for relevant specialists to visit the site where required.
- 6.45 The Historic England Science Advisor can be consulted for advice on appropriate approaches to sampling and other archaeological science components.

²¹ Including Andrews *et al* 2015 and Historic England 2017b.

²² Historic England 2015c. and Archaeological Data Service 2009

Artefact Recovery

- 6.46 All stratified archaeological finds will be collected, except for modern (mid-20th century or later) finds from topsoil and subsoil contexts unless it is determined that they are of archaeological interest. All artefacts will be bagged and labelled by context.
- 6.47 Removal, packaging, and labelling of finds will be undertaken in accordance with 'First Aid for Finds'²³ and specific Historic England guidance as required.

Environmental/Sediment Sampling and Scientific Dating

- 6.48 All sampling must be undertaken to a bespoke strategy to be set out in the project WSI. It is to be produced in consultation with specialist advice, and in accordance with best practice guidance (including specific guidance on industrial residues, geoarchaeology, animal remains and dating, where appropriate).²⁴
- 6.49 The classes of material to be sampled, and the methodology for collection and assessment, will be dependent on:
 1. The nature of past environments, landscape processes and activities;
 2. The types of material to be recovered to address the objectives of the project;
 3. The types of material likely to survive given anticipated ground conditions
- 6.50 The sampling strategy should also identify a process for determining when scientific dating will be considered, and the most likely forms appropriate to the site (such as radiocarbon dating, luminescence dating, archaeomagnetic dating, or dendrochronology).
- 6.51 Provision should also be made in the WSI for the sampling strategy to be refined at suitable stages during the fieldwork programme, utilising appropriate specialists where necessary including the Historic England Regional Science Advisor.

Human Remains

- 6.52 Should any inhumation or cremation burials be encountered, their extent, number and state of preservation will be established and SYAS will be notified to discuss an appropriate strategy for their management. Remains should not be removed or chased beyond the existing limits of excavation prior to agreement with SYAS.
- 6.53 Where it is deemed necessary, a licence for removal will be requested from the Ministry of Justice, and SYAS notified, and no development should take place until burials are removed or alternate arrangements made.
- 6.54 The treatment of human remains will be in accordance with the requirements of Civil Law and all relevant best practice guidance.²⁵ The remains will be recorded in-situ before lifting in accordance with best practice guidance.²⁶

Treasure

- 6.55 Artefacts defined as treasure under the Treasure Act 1996 (as supplemented by the Treasure (Designation) Order 2002) will be treated in accordance with the Treasure Act 1996 Code of Practice.²⁷ All finds of treasure must be reported to the local coroner within

²³ Watkinson and Neal 1998

²⁴ Historic England 2011, 2015d, 2018b, 2019 and 2022.

²⁵ APABE 2017

²⁶ Brickley, et al., 2004 and 2017 & Historic England 2018c

²⁷ DCMS 2008

14 days of discovery. In the first instance, it is recommended that details of the find are provided to the local Portable Antiquities Scheme Finds Liaison Officer to confirm that it constitutes treasure; they will be able to apply for a Treasure Reference Number and declare the find to the coroner on your behalf. SYAS should also be notified.

- 6.56 A short Treasure Report will be compiled for submission to the coroner.²⁸
- 6.57 Where recovery of treasure cannot be undertaken on the same working day as the discovery, suitable security measures will be taken to protect the finds from theft.

Post-Excavation

- 6.58 All finds are to be treated in accordance with current best practice guidance. Finds are to be cleaned and marked, according to accepted principles and in line with appropriate period/material guidelines.
- 6.59 For all categories of material recovered, including finds, palaeo-environmental, industrial and other specialist samples, an assessment by an appropriately experienced specialist will be undertaken in accordance with best practice guidance.²⁹
- 6.60 Basic stratigraphic information will be supplied to the project specialists.
- 6.61 All sediment samples collected in accordance with the project sampling strategy should be processed, sorted, and assessed (excluding samples from obviously mixed deposits, etc.).
- 6.62 Scientific dating of suitable material should be undertaken during the evaluation phase where it would assist with meeting the aims of the project.
- 6.63 Advice from appropriate specialists should be sought on the storage and conservation of unstable artefactual remains (e.g. metallic, wood or leather).
- 6.64 Ferrous objects, and a selection of non-ferrous objects (including all coins), will be x-radiographed in accordance with Historic England guidance.³⁰
- 6.65 The specialists will provide assessment reports describing the material, proposing selection for the permanent archive, and identifying recommendations for further detailed analysis and illustration in consideration of the project research objectives and any unanticipated research potential.
- 6.66 For ceramic assemblages, recording shall be carried out in a manner compatible with existing typological series in local pottery reference collections, e.g. the South Yorkshire / North Derbyshire Medieval Ceramics Reference Collection.³¹
- 6.67 The guidelines for handling Post Roman Ceramics produced by the Medieval Pottery Research Group are also to be followed, for relevant material: MPRG, 2001 "Minimum Standards for the Processing, Recording, Analysis and Publication of Post-Roman Ceramics" Medieval Pottery Res Group Occ Paper 2.

²⁸ A template treasure report can be requested from the Finds Liaison Officer

²⁹ Watkinson and Neal 1998, Historic England 2011 & Barclay *et al.* 2016)

³⁰ Historic England 2006

³¹ Available online: http://archaeologydataservice.ac.uk/archives/view/ceramics_eh_2003/

Reporting

- 6.68 As a minimum, an evaluation report to post-excavation assessment level will be produced. This will provide sufficient objective data to describe and document the results and an assessment of their importance including the research potential of the project archive.
- 6.69 Where, in consultation with SYAS, further investigation and specialist analysis is necessary to achieve the aims of the project, and this will not form part of a follow-on mitigation phase, then an updated written scheme of investigation (sometimes referred to as an updated project design) will be produced. This update will describe the additional work required and how it will be undertaken.

Evaluation Report

- 6.70 An evaluation report shall contain:
1. An introduction including background information (with planning application details, where appropriate);
 2. The original research aims and objectives and rationale for selected area of investigation;
 3. An archaeological and historical baseline;
 4. A description of results;
 5. A report of all find and sample categories to assessment level, by appropriate specialists, including their research potential;
 6. The results of any scientific dating;
 7. A discussion of the results including a phased interpretation of the site;
 8. A summary of the results in their local, regional, and national context, and the extent to which the work has addressed the project aims and objectives;
 9. An assessment of the effectiveness of the evaluation strategy, including earlier stages of work (including geophysical survey);
 10. Recommendations for any further investigation, specialist analysis or conservation, recording and/or preservation of in situ archaeological remains, to be determined in consultation with SYAS;
 11. Supporting illustrations, including as a minimum:
 - (a) A detailed location map;
 - (b) A detailed site plan showing all trenches or trial pits, as excavated;
 - (c) Plans for all trenches where archaeological features were identified;
 - (d) Detailed plans of archaeological features;
 - (e) Detailed sections of archaeological features;
 - (f) An overall (phased) site plan showing all archaeological features recorded;
 - (g) Selection of photographs of work in progress;
 - (h) Select artefact illustrations and/or photographs.
 - (i) Supporting tables of data, including as a minimum:
 12. A detailed context index;
 13. An archive index;
 14. Acknowledgements identifying those involved in the project, including SYAS.

Updated Written Scheme of Investigation

- 6.71 An updated written scheme of investigation shall contain:
1. Any changes to the aims and objectives of the project;
 2. Schemes of further investigation, conservation or specialist analysis;
 3. The requirement and content of the final analysis report;

4. Any changes to the archive arrangements, including details of proposed specialist conservation.
5. Any updates to the Selection Strategy and Data Management Plan.

Dissemination and Archive

- 6.72 The reports and results of the evaluation should be disseminated in accordance with the standards and guidelines set out in Section 7.
- 6.73 A project archive must be maintained, prepared, and deposited in a publicly accessible repository in accordance with the standards and guidelines set out in Section 8.

7 Standards for Public Engagement, Dissemination & Publication

Public Engagement & Outreach

- 7.1 Archaeological work is undertaken for public benefit and SYAS encourage opportunities for public engagement to be integrated from the outset.
- 7.2 As a minimum on all trenching/test pitting evaluation, the WSI will set out the steps taken towards establishing an engagement and outreach strategy. Where no measures are proposed, then the reason why must be clearly stated.
- 7.3 Measures to be considered include:
1. Illustrated notices displayed during fieldwork around the site (with the client's agreement), explaining what work is in progress and why, to keep members of the public informed (minimum of A3 size, with font at a minimum size of 16 point);
 2. Social media or newspaper updates;
 3. Site tours and public talks (e.g. by presenting a paper at South Yorkshire Archaeology Day and talking to local societies);
 4. Digital interpretation;
 5. Popular publications;
 6. Permanent public information board; and
 7. Any other opportunities that might be relevant for a given site.
- 7.4 A bespoke strategy shall be produced for each site.

Dissemination of Results

- 7.5 Digital and physical copies of the report must be supplied to SYAS for incorporation into the South Yorkshire Historic Environment Record. Copies of select digital data must also be provided, including geophysical results (GeoTIFFs and shapefiles of interpretative plots) and trench/pit locations (shapefiles of extents and features).
- 7.6 Printed copies of reports will be included with the physical archive to the recipient museum.
- 7.7 Copies of the report, or details on where it can be accessed, should be provided to all external specialists involved in the project and, where relevant, the archaeologist responsible for any previous geophysical surveys at the site. This is to assist in the design and implementation of future projects.
- 7.8 The archaeological contractor should initiate or update an online OASIS form³² at commencement of the project. Details of the results and archive are to be added, along with a copy of all formal reports, upon completion of the project.

Formal Publication

- 7.9 A summary report of an appropriate length, accompanied by illustrations (at 300dpi resolution), must be prepared and submitted in digital format, for publication in *Archaeology in South Yorkshire* or an equivalent SYAS publication.
- 7.10 Where results warrant it, and following discussion with SYAS, formal publication in the form of a journal article or monograph should be produced

³² Via the OASIS online portal hosted by the Archaeological Data Service <http://ads.ahds.ac.uk/project/oasis/>

Furthering Research

- 7.11 Provision must be made for updating the South Yorkshire Historic Environment Research Framework where the results of a fieldwork project contribute towards agenda topics. This is to be achieved by adding 'comments' to relevant research questions briefly summarising the results and providing a bibliographic reference to the relevant report³³..

³³ The research framework is accessible online: <https://researchframeworks.org/syrf/> - new users must register for a new account to add comments.

8 Standards for Archaeological Archives

General

- 8.1 In accordance with regional policy,³⁴ the archaeological contractor must notify the relevant museum at project initiation, mid-point review and completion stages to discuss archaeological archiving requirements. The relevant form (Project Initiation Form/ Mid-point Review Form/ Completion Form) will be filled out and sent to the museum with a copy provided to SYAS. Template forms are available for download from the SYAS website.³⁵
- 8.2 Details of archiving arrangements should be confirmed with the client and landowner at the outset, and a budget allowed for to cover the museum's expected deposition charge.

Working Project Archive

- 8.3 All material (whether digital or physical) recovered or generated through the duration of the field evaluation project will be appropriately and securely stored in a working project archive. This will be undertaken in accordance with the selection strategy and digital data management plan set out at the commencement of the project (see paragraphs 1.11-1.13).

Physical Records

- 8.4 Any physical documents or drawings will be indexed, collated, and stored in a secure location when not in use.
- 8.5 Film photography will be processed at regular intervals throughout the duration of a project.
- 8.6 Digital security copies will be made of physical records at regular intervals, to be stored and backed up in a secure location. Documents and drawings will be scanned at an appropriate resolution (no less than 300dpi for documents and drawings, 600dpi for photographic prints, and 4000dpi for negatives or slides) and to an appropriate format (e.g. a lossless format, such as TIF, for scale drawings), and scans checked for quality.³⁶ Standards adhered to should be included in the Data Management Plan. If digitised data is to form part of the final digital archive it should be treated as set out for Born Digital Records below.

Born Digital Records

- 8.7 All digital records will be treated in accordance with a project data management plan.³⁷
- 8.8 Digital records will be routinely downloaded, stored, and backed up in a secure location.
- 8.9 All digital records will be consistently labelled, files logically structured, and embedded with appropriate metadata (or have their metadata stored in an accompanying spreadsheet).³⁸

³⁴ Turnpenny 2012

³⁵ See guidance for archaeological projects, available online: <https://www.sheffield.gov.uk/syas>

³⁶ For further guidance see: [Digitisation at The National Archives](https://www.nationalarchives.gov.uk/digital-archives/)

³⁷ ClfA guidance available online: <https://www.archaeologists.net/digital>

³⁸ Archaeological Data Service 2009

Final Archaeological Archive Selection

Strategy

- 8.10 On the completion of fieldwork, the relevant specialists and recipient museum will be consulted to update the selection strategy set out in the WSI in accordance with best practice guidance.³⁹
- 8.11 This should consider all documents, finds, samples, and digital files generated during the project, including illustrations.
- 8.12 The aim of this process is to produce a project archive that allows a full re-examination and interpretation of all the results of the project whilst avoiding replication, repetition, or the retention of materials not considered germane to future analysis.

Archive Deposition

- 8.13 The final archive will then be assembled in accordance with Archaeological Archives Forum, ClfA, and museum guidelines.⁴⁰
- 8.14 Agreement in principle for full transfer of title of finds to the recipient museum needs to be obtained at the outset. Confirmation of transfer of title from the landowner and confirmation of assignment of copyright, along with a full archive inventory, will be submitted with a project completion form⁴¹ to the recipient museum. SYAS will be provided with a copy of the completion form, including the assigned accession number.
- 8.15 The recipient archive will be licensed to use the deposited material, in perpetuity, without restrictions; this licence will allow the archive to reproduce material, including for use by third parties, with the copyright owner suitably acknowledged.
- 8.16 It is preferred practice for generated material to be archived in its original medium (i.e. physical or digital). Digitising of physical records will only be considered where it retains the same level of accessibility and information as the original medium.
- 8.17 The physical archive will be deposited with the appropriate museum. A copy of the archive receipt will be provided to SYAS.
- 8.18 The digital archive will be deposited with a Trusted Digital Repository (CoreTrustSeal certified). For archaeological archives this is presently limited to the Archaeology Data Service (ADS) at the University of York. A link to the final digital archive will be provided to SYAS.

³⁹ AAF 2011, SMA 2020 & ClfA toolkit for selection archaeology: <https://www.archaeologists.net/selection-toolkit>

⁴⁰ AAF 2011, ClfA 2020e & Tumpenny 2012

⁴¹ Utilising the proforma agreement available online: <https://www.sheffield.gov.uk/home/planning-development/south-yorkshire-archaeology-service/guidance-for-archaeological-projects>

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